

**Joint Session with SPE
Radisson Hotel – Greentree
6 November 2006**

Is Underbalanced Drilling the Right Answer for Your Reservoir

presented by

**P. V. (Suri) Suryanarayana
SPE Distinguished Lecturer
Blade Energy Partners**

Abstract

Underbalanced drilling (UBD) has evolved from a drilling technique into a reservoir exploitation tool. The primary benefits of UBD motivating its increasing consideration are enhanced productivity through mitigation of invasion damage, and reservoir characterization using UBD data. However, selection and valuation of UBD candidates still remains a largely arbitrary and heuristic process. In this lecture, we present a rigorous, integrated approach that takes into consideration cost, value and risk to evaluate the UBD candidature of a reservoir. The benefits and risks (particularly contra-indicators) of UBD are first articulated through numerous examples. The emerging art of reservoir characterization using UBD data is also presented with examples. Since the main premise of UBD is that it mitigates damage from conventional overbalanced drilling, it is important to first characterize such damage, and evaluate the potential for UBD to improve performance. We present an approach that combines results from special core tests with dynamic invasion modeling using fine-grid simulators to

assess and quantify invasive damage and its impact on production. Results are illustrated using video clips. Finally, we present a rational valuation approach that uses probabilistic productivity estimation tools together with dynamic simulation methods to obtain expected production curves when UBD is applied. Selection of appropriate candidates in the context of these methods is discussed. The lecture provides a broad coverage of recent developments and new challenges in reservoir application of UBD.

Author Biography

P. V. (Suri) Suryanarayana is a founding partner and Executive VP of Blade Energy Partners, an independent engineering, research, training and project management company. Prior to starting Blade in 2000, Suri was Senior Technologist in Mobil in their E&P technical center, and Drilling Engineering Advisor in Mobil North Sea Ltd. Suri's contributions span a wide range of upstream energy topics, including advanced mechanics, well construction engineering, quantitative risk analysis, stochastic design, Coiled Tubing, UBD, and reservoir engineering. He has over 40 archival publications on various technical subjects, and has given numerous invited talks on a range of industry topics. Current interests include reservoir application of underbalanced drilling, reservoir characterization, formation damage assessment, deepwater engineering, stochastic optimization for design, and multiphase flow. Suri received his PhD in Mechanical Engineering from Rice University in 1991. Several recent papers by Suri discuss the subjects covered in this lecture.

For reservations to this informative and entertaining evening, please complete the attached reservation form.

WHAT IS THE PAPG?

PAPG is a non-profit organization founded in 1984 to provide a forum for Petroleum Geologists in the Pittsburgh Area to meet socially and discuss technical topics relative to the exploration and development of reserves in the Northern and Central Appalachian Basin. PAPG is an affiliated association with AAPG (American Association of Petroleum Geologists) and has representation in the House of Delegates. Educational opportunities are provided via field trips, seminars and AAPG Sectional meetings, sponsored solely by PAPG or in conjunction with the PTTC (Petroleum Technology Transfer Council), PGS (Pittsburgh Geologic Society) and SPE (Society of Petroleum Engineers).

Although PAPG is predominately a geologic organization, numerous industry professionals including geophysicists, engineers, lawyers and landmen are among PAPG's members and find the interaction at meetings and educational opportunities beneficial to their professions. PAPG also encourages student membership and participation.

Meetings are typically held monthly from September through May in locations within 50 miles of downtown Pittsburgh. From time to time, meetings are held in conjunction with SPE and PGS.

PAPG 2006-2007 DUES

PAPG dues for the 2006-2007 season are now DUE!

The membership form is attached to this newsletter. Please fill the form out **completely** so that we can ensure that we have your latest contact information. We are planning to publish a membership directory this year and your updated information is crucial.

NOTICE OF OCTOBER 2006 MEETING PITTSBURGH ASSOCIATION OF PETROLEUM GEOLOGISTS

DATE: Monday 6, November 2006

PLACE: Radisson Hotel - Greentree
101 Radisson Drive,
Pittsburgh, PA 15220
412-922-8400

TIME: 11:30 AM – Lunch (New York Deli)
12:15 PM – Speaker

TOPIC: “Is Underbalanced Drilling the Right Answer for Your Reservoir?”

SPEAKER: P.V. (Suri) Suryanarayana

COST: \$25.00
\$10.00 students
(Checks payable to SPE)

RESERVATIONS: Call, email, fax, or mail this reservation form to:

Barbara A. Purks
412-787-5403 (phone)
412-787-2906 (fax)
bpurks@pittsburgh.oilfield.slb.com

NAME(S) _____

COMPANY

Mark your calendar now for these upcoming events:

**December 2006 –
Christmas Party**

**January 2007 –
PAPG/SPE Joint Meeting**
“Appalachian Shale Plays”
Bill Zagorski – Great Lakes Energy Partners L.L.C.

CONTACT THE PAPG

PAPG Officers:

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PLEASE INDICATE YOUR MEMBERSHIP STATUS BY CHECKING THE APPROPRIATE BOX:

PROFESSIONAL - RENEWAL

STUDENT - RENEWAL

PROFESSIONAL – NEW MEMBERSHIP

STUDENT - NEW MEMBERSHIP

The **PITTSBURGH ASSOCIATION OF PETROLEUM GEOLOGISTS** membership year runs from JUNE 1 through MAY 31. Monthly meetings are usually held the second Thursday of the month from September through November and January through May.

Professional Dues are \$25.00 per year

Student Dues are \$10.00 per year

NEW APPLICATION: If you have never been a member of PAPG, please fill out the remainder of the form, obtain the signatures of two members to sponsor you, and mail check, payable to PAPG, to the address below.

RENEWAL: Please fill out the mailing address/directory information below if your contact information has changed and submit dues, payable to PAPG, to the address below.

Mail completed form and dues payment (checks only) to:

Dave Boyer
Texas Keystone, Inc.
560 Epsilon Drive
Pittsburgh, PA 15238

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**WOULD YOU LIKE YOUR CONTACT INFORMATION PLACED
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TWO SPONSORS REQUIRED for NEW MEMBERS

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Name _____ Date _____